

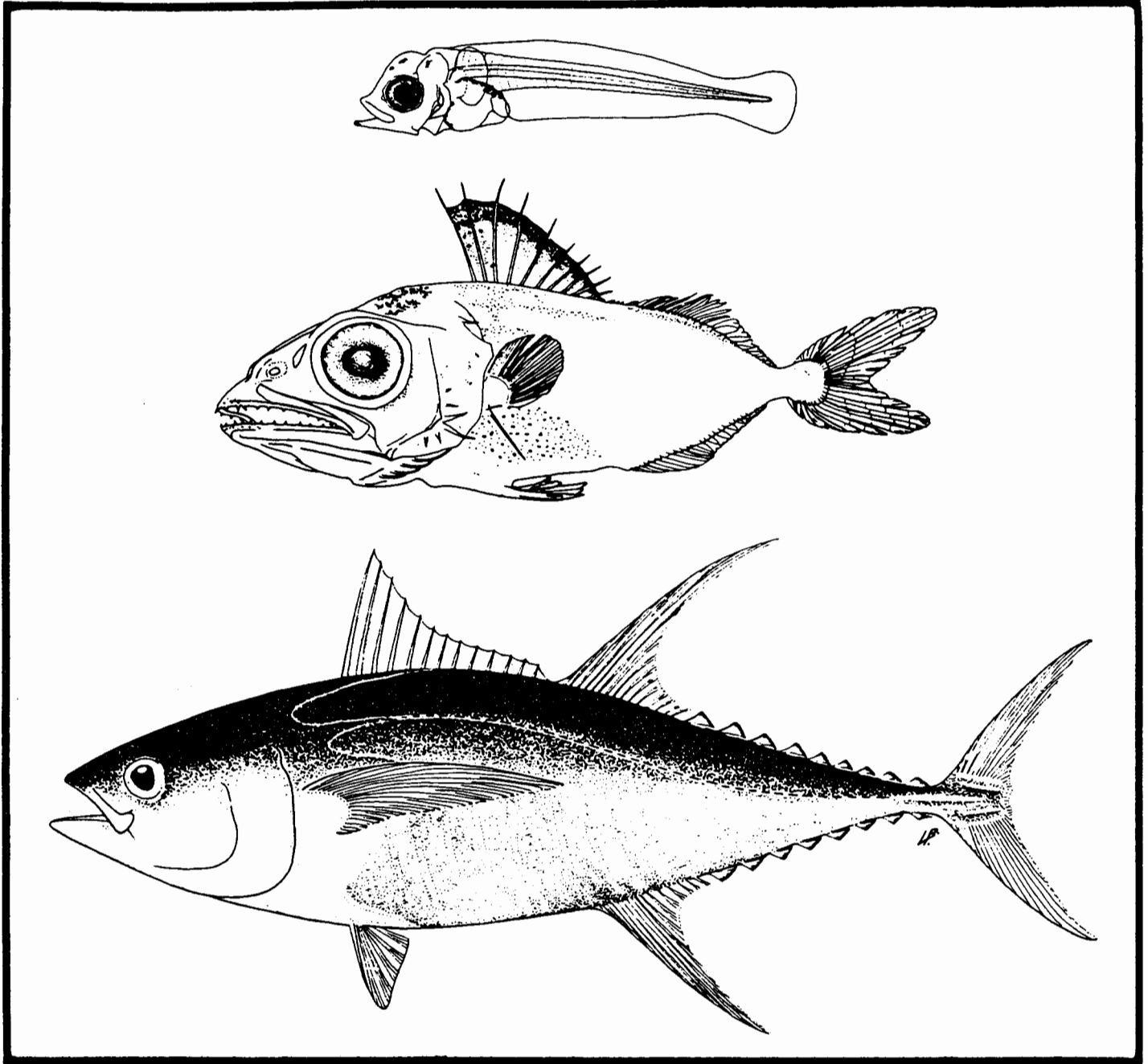
Distribution, Growth and Mortality of Three Species of Scombrid
Larvae Around the Mississippi River Discharge Plume

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Since 1986 we have conducted six cruises to investigate the role of the Mississippi River discharge plume in recruitment processes of selected Gulf of Mexico fishes. The plume environment is dynamic, but basically consists of three water masses: low salinity plume water, Gulf of Mexico shelf water and frontal water (a mixture of the former two). Sampling along 15 km transects with Tucker trawls (0.333 mm; 1 x 1 m) and neuston nets (0.947 mm; 1 x 2 m) has produced significant numbers of king and Spanish mackerel (*Scomberomorus cavalla* and *S. maculatus*) and yellowfin tuna (*Thunnus albacares*) during both high (April) and low (September) flow regimes. All three species were most abundant at stations with intermediate salinities (26-31^{0/00}), i.e., around frontal waters. King mackerel (N=100) ranged from 2.9 - 23.0 mm SL, Spanish mackerel (N=987) 2.8 - 24.0 mm SL and yellowfin tuna (N=767) 2.6 - 8.7 mm SL. Based upon otolith microstructure, ages were 1-17 d, 1-19 d and 3-14 d, respectively. Spanish mackerel grow fastest, followed by king mackerel and yellowfin tuna; the species are represented by the linear absolute growth equations $SL = -1.3 + 1.31 \text{ age (d)}$, $SL = 0.37 + 0.82 \text{ age (d)}$ and $SL = 1.67 + 0.47 \text{ age (d)}$. Both king mackerel and yellowfin tuna showed significantly higher growth in the vicinity of plume, while Spanish mackerel did not. Instantaneous daily mortality rates (Z) in the vicinity of the plume, ranged from 0.66 for Spanish mackerel to 0.21 for king mackerel; yellowfin tuna had an intermediate rate of 0.33. Mortality rates for Spanish mackerel were lower during the low flow regime (when most spawning occurs) than the high flow regime (low flow Z = 0.60, N = 615, ages 11-17 and 19 d; high flow Z = 0.68, N = 122, ages 12-18 d). Mortality rate of king mackerel in the vicinity of the discharge plume was lower (Z = 0.21, N = 47, ages 1-12, 16 and 17 d) than for those collected elsewhere in the Gulf of Mexico (Z = 0.83, N = 360, ages 4-10 d). These results suggest that the discharge plume is an environment that enhances growth and survival, and thus may lead to differential recruitment for young scombrids found there.

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